

Remarks

The Office Action mailed May 18, 2005 has been received and reviewed. Claims 5-7 and 13-15 having been amended, the pending claims are claims 1-24.

Claims 5 and 13-15 have been rewritten in independent form. Claims 6-7 have been amended to depend from claim 5.

Reconsideration and withdrawal of the rejections are respectfully requested.

Rejection under 35 U.S.C. §102, or in the alternative under 35 U.S.C. §103

The Examiner rejected claims 1-4, 8-12, and 16-24 under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Noda et al. (U.S. Patent No. 5,840,384). Applicants respectfully traverse the rejection.

The Present Invention

The present application addresses the problem of providing an aqueous coating composition having low volatile organic compound content. The coating composition can be useful for coating the inside of containers.

In one aspect, the present invention provides a method of making a coating composition (e.g., independent claim 1). The method includes the step of blending an epoxy material, a reactive diluent, and an acrylic resin. "The reactive diluent preferably functions as a solvent or otherwise lowers the viscosity of the blend of reactants. . . . The use of one or more reactive diluents as a 'solvent' eliminates or reduces the need to incorporate a substantial amount of other cosolvents (such as butanol) during processing." (Present specification at page 5, line 29 to page 6, line 2). The method further includes reacting the epoxy material and the acrylic resin to form an epoxy acrylate resin; dispersing the reactive diluent and the epoxy acrylate resin into water; and polymerizing the reactive diluent.

In another aspect, the present invention provides a method of coating a substrate (e.g., claim 20). The method includes the step of applying a coating, prepared according to the method

of claim 1, on a substrate. *Notably, the reactive diluent in a coating prepared according to claim 1 has been polymerized.* The method further includes the step of hardening the coating.

In still another aspect, the present invention provides a coating composition (e.g., independent claim 23). The coating composition includes: an aqueous dispersion of an epoxy acrylate resin and *a polymerized reactive diluent.*

Moreover, the present specification describes reactive diluents, for example, as follows:

As used in the present invention, "reactive diluent" relates to monomers and oligomers that are essentially non-reactive with the epoxy resin or any carboxylic acid moiety that might be present, e.g., on the acrylic resin, under contemplated blending conditions. The reactive diluents useful in the present invention are also capable of undergoing a reaction to form a polymer, described as an interpenetrating network with the epoxy acrylate, or with unsaturated moieties that may optionally be present, e.g., on the acrylic resin. Reactive diluents suitable for use in the present invention preferably include free-radical reactive monomers and oligomers. A small amount of reactive diluent that can undergo reaction with the epoxy resin may be used (e.g., hydroxy monomers such as 2-hydroxy ethylmethacrylate, amide monomers such as acrylamide, and N-methylol monomers such as N-methylol acrylamide). Reactive diluents useful in the present invention include, for example, vinyl compounds, acrylate compounds, methacrylate compounds, acrylamides, acrylonitriles, and the like. (Present specification at page 5, lines 3-17).

Thus, while the reactive diluent can function as a solvent or otherwise lower the viscosity of the blend of reactants used in the above-described method of making a coating composition, the method further includes polymerizing the reactive diluent to provide the coating composition. The coating composition that includes the *polymerized reactive diluent* can be useful for coating a substrate, and preferably, can be hardened. Moreover, such coating compositions can have low volatile organic compound content.

Noda et al.

Noda et al. disclose "[a]n aqueous coating composition for exterior surface of a can, in which the resin component comprises a water-soluble or water-dispersible resin product prepared by reacting a resin having carboxyl functionality (a), an epoxy resin (b) and a tertiary amine (c), at least 50 mole % of the epoxy groups of said epoxy resin (b) being quaternary ammonium salt" (abstract). Noda et al. further disclose that "[t]he can exterior coating composition of the present invention may optionally include, as a reactive diluent, aminoplast, polyether-polyol and the like" (column 4, line 66 to column 5, line 1 of Noda et al.).

However, Noda et al. fail to directly and unambiguously disclose polymerizing the aminoplast or polyether-polyol, and thus, also fail to disclose a *coating composition* including *polymerized aminoplast* or *polymerized polyether-polyol*. Thus, Applicants respectfully submit that Noda et al. does not anticipate claims 1-4, 8-12, and 16-24.

Further, Applicants respectfully submit that one of skill in the art would have no motivation to modify Noda et al. to arrive at the presently claimed invention. Specifically, Applicants respectfully submit that the aminoplast or polyether-polyol disclosed by Noda et al. is not a disclosure of a "reactive diluent" as described in the present application for at least the following reasons.

The Examiner pointed to the passage at column 4, line 54 through column 5, line 5 of Noda et al. for an alleged disclosure of "polymerizing the reactive diluent," where "steps (a) through (d) take place simultaneously." The passage recites the following:

In the present invention, the aforementioned mixture of the resins is solubilized or dispersed in water, and the *curing of the coating* proceeds, for example, by the esterification reaction between the epoxy group formed from the ammonium salt in the quaternary ammonium salt-containing epoxy resin through decomposition during heating and the carboxyl group of the resin having carboxyl functionality, by the reaction between the epoxy group of the aforementioned epoxy resin and the secondary hydroxy group of the epoxy resin, by the esterification reaction between the secondary hydroxy group of the epoxy resin

and the carboxyl group of the resin having carboxyl functionality or by like reaction.

The can exterior coating composition of the present invention may optionally include, as a reactive diluent, aminoplast, polyether-polyol and the like. However, it is preferable that the amount of these compounds is less than about 10% by weight per total solids of the coating composition since these compounds can cause the generation of fumes.

(Column 4, line 54 to column 5, line 5 of Noda et al.; emphasis added).

Applicants respectfully submit that the above-recited passage does not directly disclose polymerizing the reactive diluent. Applicants also note that column 4, line 54 through column 5, line 5 of Noda et al. is not even directed to *preparing a coating composition*, but instead is directed to *curing a coating*. Thus, even if the passage noted by the Examiner arguably did disclose (e.g., perhaps through inherent disclosure) polymerizing the reactive diluent, the polymerization would result during the curing of the coating, not during preparation of the coating composition. Thus, Applicants respectfully submit that Noda et al. fail to disclose or suggest a *coating composition* that includes a *polymerized reactive diluent*.

In view of the remarks presented herein above, Applicants respectfully submit that claims 1-4, 8-12, and 16-24 are neither anticipated nor obvious over Noda et al.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 5-7 and 13-15 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim. Claims 5 and 13-15 having been rewritten in independent form, and claims 6-7 having been amended to depend from claim 5, Applicants respectfully submit that claims 5-7 and 13-15 are in condition for allowance. Notification of the allowance of claims 5-7 and 13-15 is earnestly solicited.

Amendment and Response

Page 11 of 11

Serial No.: 10/506,984

Confirmation No.: 2347

Filed: December 15, 2004

For: COATINGS HAVING LOW VOLATILE ORGANIC COMPOUND CONTENT


Summary

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
WIND et al.

By
Mueeting, Raasch & Gebhardt, P.A.
P.O. Box 581415
Minneapolis, MN 55458-1415
Phone: (612) 305-1220
Facsimile: (612) 305-1228
Customer Number 26813

August 18, 2005
Date

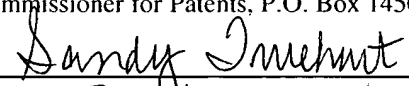
By: 
Loren D. Albin
Reg. No. 37,763
Direct Dial (612) 305-1225

CERTIFICATE UNDER 37 CFR §1.10:

"Express Mail" mailing label number: EV201893129 US

Date of Deposit: August 18, 2005

The undersigned hereby certifies that this paper is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to **Mail Stop Amendment**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By: 
Name: Sandy Truehart
